

Viola oconensis × *sagittata* hyb. nov.

The early leaves with deltoid-ovate blades similar to those of *V. emarginata*, the later leaf-blades lanceolate-oblong, showing at the base both cucullate and sagittate characters; slight traces of pubescence often found on the upper leaf surfaces and peduncles: the flowers large, 2–3 cm. broad and purplish-blue; petaliferous flowers apparently not developing capsules, the peduncles withering soon after flowering: cleistogamous flowers numerous but their capsules small and abortive.

Low meadows, bordering swamps in which occurs *Viola oconensis*; near Pendleton (but in Oconee Co.) South Carolina, *H. D. House*, 1804, April 10, 1906.

The extent of my field studies thus far shows that this region is no exception to those localities already studied by the writer in regard to the abundance of natural hybrids among the violets. Many forms are under observation and the hybrids thus far detected are as follows:

Viola emarginata × *sagittata* Brainerd, *Rhodora* 8: 58. 1906.

Tomassee, Oconee Co., *H. D. House*, 2026, May 5, 1906.

Viola emarginata × *papilionacca* House, *Rhodora* 8: 120. 1906.

Open coves at limit of cultivation, Rabun Bald, Rabun Co., Georgia, *H. D. House*, 2254, June 1–4, 1906.

Viola palmata × *villosa* Brainerd, *Rhodora* 8: 56. 1906.

Open woods with *V. palmata* and *V. villosa*, near Clemson College, Oconee Co., South Carolina, *H. D. House*, 1930, April 25, 1906.

Viola affinis × *villosa* Brainerd, *Rhodora* 8: 56. 1906.

Near Clemson College, Oconee Co., S. C., *H. D. House*, 2357a, June 15, 1906.

CLEMSON COLLEGE, SOUTH CAROLINA.

NOTES ON SOME FERNS COLLECTED NEAR ORANGE, NEW JERSEY

BY RALPH CURTISS BENEDICT

The ferns under consideration were collected on a trip with the Torrey Botanical Club on June 22, 1907. The route lay over part of the range of hills known as the Orange Mountains,

and included in its course a variety of wooded hills and swamps and open fields.

An old well contained the first fern of especial interest, a small plant of the Japanese *Cyrtomium falcatum*, a fern commonly cultivated for fern-dishes, and related to our genus *Polystichum*. Its occurrence at that place is explained by the presence of a greenhouse near by, from which the spore which produced this plant was presumably blown. It grew in a crevice of the well-coping, protected from either extreme heat or cold by the partly open flooring of the well-house, and was of a size to indicate that it lived through at least one winter. With a little protection, it should prove hardy in the latitude of Washington and further south.*

Of the native ferns, about twenty species were seen, including members of eight genera of the Polypodiaceae, of *Osmunda*, and of *Botrychium* and *Ophioglossum*. The last was found in an old sedgy meadow, apparently a former lake which had been filled in by vegetative growth. After a close search, a considerable supply was found but it was not yet matured. For those who have not found this fern growing, a descriptive note may be of interest. The texture is soft and flabby, almost exactly like that of the common sheep-sorrel, *Rumex Acetosella*, but the color is lighter and the leaf, of course, is not lobed.

A low wet woods in the same valley contained a fine series of the *Dryopteris marginalis-spinulosa-cristata* group, including some of the less common members.

D. MARGINALIS, in its normal form, was found here and throughout the trip.

D. SPINULOSA. The form usually considered the type was found several times. It seems to be commoner in this region than the variety *intermedia* and grows generally in low damp woods. In central and northern New York, the reverse is true. The common form is *D. spinulosa intermedia*, which frequents rocky slopes and upland woods, but is found at its best on shady exposures. The form I identify as the type varies considerably in the cutting of the frond, but is probably never so much

*The writer has since seen this fern in cultivation out-of-doors at Stamford, Conn., where it is protected in the winter by a few inches of leaves.

divided as the variety, and the pinnae and pinnulae are generally more distant. It may include more than one form.

D. SPINULOSA INTERMEDIA. Only one or two clumps were found. Besides the characters ordinarily given, this variety may be distinguished from the preceding in two respects. It matures its sori a month or more earlier; in this latitude, about the middle or last of June. Its sporangia appear dark-brown or blackish, as compared with the pale-brown sporangia of the so-called type form. There seems to be some question whether the type form really occurs in this country. A representative set of the species, comprising our three recognized forms, was sent to Dr. Christ of Basel, Switzerland, who identified all the specimens as *D. spinulosa exaltata*, a European variety. This, however, was not justified by the material.

Is it not probable that we have included under this species a complex of independent and mostly coördinate forms, corresponding, perhaps, to the known varieties; in other words, elementary species? Such forms as appear to intergrade might be explained as crosses. A point in favor of this explanation is found in the fact that not infrequently such intermediate forms have only abortive sori and sporangia, a character nearly always associated with the recognized hybrids of *Dryopteris*.

D. CRISTATA. Frequent, the commonest of the group.

D. CLINTONIANA (D. C. Eaton) Dowell* (*D. cristata Clintoniana*). Distinguished from the preceding by its much broader and larger fronds; the sori, also, are much closer to the midveins of the pinnulae. Several plants were seen.

D. BOOTHII. One group of vigorous plants.

D. CRISTATA \times MARGINALIS. One group of strong plants with hardly an abnormal frond.

Cultural and field work is being carried on with the hope of clearing up some of the points of difficulty regarding these species and the writer would be glad to exchange material collected in this locality and in central New York for specimens from other sections.

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* Proc. Staten Is. Assoc. 1: 64. My 1906.